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Extension Division Notes.

By A. D. Wilson, Supt.

By having cows freshen in the fall instead of in the spring, from 25 to 50 pounds of butter-fat may be added to the production of each cow each year. This is a point in the management of every dairy farm that should receive your attention.

If your cattle are not making satisfactory returns for feed this winter, do not decide that it does not pay to feed well; as they will no doubt make better returns next summer, and even next winter, for having been fed well this winter. Animals must be kept in good condition all of the time, in order to give profitable returns.

Rotation of crops is one of the simplest, practical methods of increasing the productivity of the farm and reducing labor. If you are not already practicing rotation in your farming, now is a good time to work out a systematic cropping scheme for your farm. A practical system of rotation can be worked out for every farm.

Good seed-corn is the key to getting good stands of corn. A good stand of corn is necessary to secure good yields. Owing to the wet fall of 1911, there is now much doubtful seed-corn in the country. One cannot afford to plant corn any year, much less this year, without thorough testing. The single-ear method of testing seed-corn is the only practical method.

There are very few farms on which additional labor expended in preparing the seed-bed would not yield handsome returns. It costs about 15 cents per acre to harrow land, and about 35 cents per acre to disk land. For \$1, it can be double-disked and harrowed twice. One bushel of wheat, barley, two bushels of corn, or one bushel of flax, increase per acre and pay for this extra labor.

Good seed is one of the important factors in the production of good crops. Good seed should be plump, heavy in weight, should germinate well, and be free from weeds, and should be pure as to variety. Cleaning and grading seed grain is a timely operation at this season of the year, and is likely to return more per hour of labor than one gets for doing the ordinary farm work.

Weeds cause an annual loss to this state of many millions of dollars. Weeds are often distributed with the seed or seed-grain sown. Too much care can hardly be taken in making sure that no bad weeds are sown in this manner. If you do not know any of the weed-seeds found in your farm seeds, send a small sample to the Experiment Station, and have them identified. This will be free.

Summer Training Schools at Schools of Agriculture.

Last year a Teachers' Training School was held at the School of Agriculture, St. Anthony Park, in connection with the regular Summer School of the College of Agriculture. The registered attendance in training was 9. So satisfactory was the school that those attending, that the Department of Public Instruction will maintain such a school for six weeks this year, at each of the Schools of Agriculture, at St. Anthony Park, Crookston and Morris.

The schools will open June 17th and close July 28th. Instruction will be given in all subjects required for a late First Grade Certificate, including Arithmetic, Grammar, Geography, U. S. History, Civics, Physics, Reading, Spelling, Composition, Penmanship, Algebra, Plane Geometry, Physiology, and Physical Geography. In addition, work will be given in Agriculture, Manual Training, Domestic Science, Domestic Art, Drawing, Music and plain model work.

Two primary instructors will be employed. One will give her attention to reading, Language and number work. The other will give her attention to primary methods, such as the making of reading charts, number charts and kinds of "busy work." Thus the teacher will be able to go back to her school loaded with a wealth of material for doing better work next year. Students doing double work, and receiving a satisfactory mark, will be given credit for the subject, at the close of the summer, on a teacher's certificate, without taking an examination. Students doing double work in Algebra, Geometry and Physics will be given one-half credit for each subject, and it will be necessary to take the subject at the next Summer School in order to receive a full credit. The work in the other subjects will be a thorough review, preparatory for an examination which will be held at the close of school.

Students will be given rooms at the dormitory, and meals will be served in the dining hall. Charges will be made as moderate as possible. Rooms will be assigned in order of applications received; and those planning to attend will do well to apply early.

These schools are not intended to supplant other schools in the State, but to offer opportunity to teachers in counties where no summer school is held. The instruction offered will be thorough and practical. Experienced instructors will be secured, who are able to stand before their classes and "acceptably best the subjects in hand." Bulletins will be issued soon, giving full details. Any one desiring full information may write to Mr. J. M. Drew, Registrar, School of Agriculture, St. Anthony Park, or to the Superintendents of the Schools of Agriculture at Crookston and Morris.

The Use of Fresh vs. Rotted Manure.

Most people have an idea that rotted manure is a much more valuable fertilizer than manure fresh from the barns or yards. This idea prevails because of the heavy, compact nature of the rotted manure. The value of manure is determined by the amount of various elements of fertility contained therein. These elements are mainly nitrogen, phosphoric acid and potash. They are usually figured at 15c, 6c and 5c per pound respectively. On this basis a ton of fresh barnyard manure is worth \$1.98. A ton of rotted manure is worth \$2.04 or only 6c more. When the fact is considered that it takes nearly 2 tons of fresh barnyard manure to make one ton of rotted manure, owing to the loss from evaporation and leaching, it can be seen that much of the fertilizing matter originally contained is lost in the rotting process. In Bulletin No. 122, the Maryland Agricultural Experiment Station reports some interesting observations on the experimental use of fresh and rotted manure. Both were used on the corn and wheat crops, in comparison with unmanured land. The yield of corn on unmanured land was 38.1 bushels per acre. On land dressed with rotted manure, a yield of 65.1 bushels were secured; and where fresh manure was applied, the yield was 70.7 bushels per acre. The increased yield of corn from the use of rotted manure was 27.6 bushels, and from the use of fresh manure, 32.6 bushels, an increase of 5 bushels per acre in favor of the fresh manure. On the wheat crop the effect was similar, though not so marked. On the unmanured land, the wheat yielded 16.1 bushels per acre; where rotted manure was used, 19.1 bushels; and on the land dressed with fresh manure, 19.7 bushels per acre were secured. The increase in favor of the fresh manure is only .6 bushels per acre on the wheat crop.

While the increased returns are comparatively small in both cases, it illustrates clearly the fact that fresh manure is at least as good as the rotted manure, and for some crops even better. The prevention of loss by leaching and in the rotting process should be kept in mind, and the saving in labor by applying manure fresh from the barns is worthy of consideration. It should not be understood that the coarse, fresh barnyard manure is adapted to all crops. It would not be suitable for certain forms of garden and vegetable crops; and even for the small grains, on light soil, it probably would not give as good results as the rotted manure. Where manure is applied as it should be, however, on the grass land, or just ahead of the corn crop in rotation, the coarse, fresh manure is better adapted to the succeeding crop than the rotted manure. The heat, and the effect of the acids developed in the process of decomposition, aid greatly in liberating plant-food and result in greater crop yields.

Some objections may be made on the score that weed-seeds or possibly plant diseases are spread with the unrotted manure. Where applied as suggested above, however, at the proper place in rotation, neither the weeds nor the plant diseases resulting therefrom will be a serious consideration. The late winter and early spring offer many opportunities for getting manure on the land. These should be taken advantage of; though one should avoid driving over the land when it is very wet from melting snows or from heavy rains. The good effect of the manure may be entirely offset by bad handling of the land.—Andrew Boss, Prof. of Agriculture Minn. University Farm.

Counting 75 pounds to the bushel, the highest yield in the Boys' Corn Contest in Will County, Ill., was 117 bushels and 60 pounds to the acre; the average among the 34 contestants being over 82 bushels per acre. Illinois has a longer growing season than Minnesota; but it will be interesting to compare the results obtained by Minnesota boys, on a "quicker" soil and with earlier-maturing varieties, with those of their rivals further south.

Captains of Co-Operation.

To the men who—by virtue of their exceptional ability to discern the conditions of success in various large undertakings, backed by a genius for organization and the influence which comes from commanding powers—have become leaders in the various lines of production and transportation, the American people are fond of applying the name "Captains of Industry." And that to such men, rather than to knights and warriors as of old, we are prone to award the highest social status, is not the smallest of the many indications of the growing ascendancy of ideals which make for peaceful progress, over those of a receding barbarism.

But it is significant that, while Agriculture is the foremost of American industries and the basis of all others, so few of the aforesaid Captains of Industry are to be found among our farmers. We hear, now and then, of a "Peach King" in the East, of a "Corn King" in Missouri; of a "Cotton King" in some Southern State. He is usually entitled to a place among the Captains, if at all, only from the fact that he has acquired, and shown himself able to manage with unusual success, an exceptionally large acreage of land devoted to the crop from which he takes his royal title. It might seem from this that, if Agriculture is ever to show its due proportion of Captains of Industry, it must be through the building up of great estates, to the sacrifice of the democracy whose best exponent is the small farm.

But the steady growth of the principle of co-operation among farmers, and its application in an increasing variety of forms, would appear to open before able and aspiring men such opportunities for conspicuous leadership as make those offered by the ownership and skillful management of a single big estate seem insignificant by comparison. The man who can take the lead in encouraging, directing and organizing the forces which make for co-operation in an agricultural community, will not only be at the head of larger affairs than any of the aforesaid "kings," but he will perform a more beneficent work. For, while—as one of the co-operators—he may well share in the individual gains of co-operation, the main inspiration for his endeavors must ever be a lofty public spirit, which kindles everywhere among his fellows a desire to "help one another," as the surest way of advancing one's self.

Prior to 1882, Denmark was a comparatively poor country; its farmers an ignorant peasantry; its agricultural resources undeveloped. In that year agricultural co-operation had its beginnings; and, in the thirty years which have since intervened, it has wrought a complete social and economic revolution. Not only has Denmark now become, next to England (population considered) the richest country in Europe, but the whole population has experienced an educational and social uplift. Hardly anywhere has co-operation been developed in so many phases. In it has been found the key to universal prosperity.

What has been done in Denmark, can be done, under efficient leadership, in Minnesota and every other American State, American life, if it is true, is already on a far higher plane than that of Denmark thirty years ago; but the uplift which comes from the development of co-operation should therefore be grander in a relatively long period. And the honor which shall come to the Captains of Co-operation, who take the lead in such development, shall far outshine that which is bestowed today on the Captains of Industry; who, after all, are only the best representatives of the selfish individualism we once glorified, but which is now recognized as inimical to the best interests of American democracy.—C. R. Barns, Extension Division, Minn. College of Agriculture.

Co-Operative Bacon-Curing.

Between the price of \$5.75 to \$6.26 per 100 pounds, which has lately been paid for hogs at the Western markets, and the 15 to 27 cents a pound paid by city consumers for bacon and hams, the margin is so great as to suggest the possibility of large gains to hog-raisers, if, in each community, they will learn to co-operate in selling their pork in the form of a finished product instead of "on the hoof." Such co-operation would be another step in advance, along the same line as the system of marketing of corn in the form of cattle and hogs rather than as grain; or as the disposal of milk and cream through the co-operative creamery.

In Denmark, where co-operative bacon-curing began only twenty-five years ago, by far the larger portion of the business—which necessarily carries with it all the other details of the pork-packing industry, as well as the curing of bacon, hams and shoulders—is now in the hands of co-operative societies. Like the creamery, the co-operative bacon-curing estab-

lishment not only brings a larger revenue to the farmer from his product, directly; but it keeps upon the farms a large amount of fertilizer which would otherwise go to waste, or else, after passing through the packing concern, be shipped back to the fields at a vastly enhanced cost.

The greater part of the bacon and hams now consumed in the Northwest are taxed with a double freight-charge—that on the live hogs from the farms to the packing-houses at South St. Paul, Chicago and Omaha, and that on the finished products sent back for distribution among Northwestern consumers. The larger part of this cost is saved when the meat is cured at the point of production. This saving is something which does not find its counterpart in the creamery.

As pork is consumed in larger amounts than butter, while the demands of the curing establishment for scientifically-trained operators are no greater than those of the creamery, it would seem that the opportunities of the American farmer for gain through co-operative "bacon-curing" are at least equal to those afforded by the creamery; and that there is no reason why the large sums saved by Danish hog-raisers through this form of co-operation should not be realized as well by the man in Minnesota or the Dakotas.

As for the old objection to local curing establishments or "slaughter houses," that they are unsanitary and offensive, modern inventions are now available which make the well-conducted curing-establishment practically as inoffensive as a creamery.—C. R. Barns, Extension Division, Minnesota College of Agriculture.

Co-Operative Threshing.

The ownership of a threshing-machine is another form of co-operative enterprise in which the farmers of a neighborhood may participate, with large advantage in many directions. The cost of an outfit, while prohibitory to the individual small farmer, is not so great that it may not be easily borne by a group of fifteen or twenty farmers; and it can of course be made to serve a much larger number. The interest on the investment is fully offset by the saving of the profit which goes to the thresherman under the present system. And, since the motive-power, detached from the threshing-machine, can be employed in other work for all the rest of the year, after the threshing season is over, the amount of capital which will for most of the year lie idle is very much reduced.

A chief advantage attending the co-operative plan is found in the fact that the thresher will be on hand at the time when it can be most advantageously used. The long waits to which most grain-growers are now obliged to submit, pending the arrival of the thresher from some other section, will be avoided. How expensive such waits are, especially when bad weather supervenes, to many growers know from painful experience. A second advantage is a saving in cost; a third, that of avoiding the introduction of weeds, which so often attends the progress of the threshing machine on its annual migrations from the South to the North.

The outfit may well include a set of fanning-mills, so that grains may be cleaned and seed selected, by men who, from constant practice have acquired superior skill. These operations, added to that of threshing, should afford such steady employment, and such wages, as would make the business attractive to high-class men—men whose every visit to the farm may be looked to as affording some fresh reinforcement to whatever progressive forces there exist.

These remarks are suggested by a paragraph telling of the organization of "about 16" farmers of the North Slope school district, in Manning Co., N. D., into a co-operative Threshing Association, which has purchased its own machinery. Once the idea is given a practical application, it would seem that those who led must soon be followed by the great army of thinking and progressive farmers.—C. R. Barns, Extension Div., Minn. Agricultural College.

Trees vs. Wheat.

The average production of wheat per acre in Minnesota, for a long period of years, has been 13 bushels per acre. Some experts declare that it takes 12 bushels of this to pay the cost of raising and marketing the crop. This leaves only one bushel for profit. The farm value of this bushel of wheat, Jan. 1, 1912, according to the Government report, was 94 cents. Supposing these averages, both of production and price, are maintained for fifty years, the net income from 100 acres of land for that period would then be \$4,700. Supposing the cleared wheat land to be worth \$40 an acre, this means a net return of only 2.35 per cent per annum on the investment.

Land devoted to forestry, in various European countries, pays three per

cent net on the investment; often considerably more. Some experimental plantings of pine in our Eastern States, and of quicker-growing trees in the West, have yielded a far higher return. But on the basis of only 3 per cent, the 100 acres of \$40 wheat-land included in the foregoing calculation, if planted with trees, would in 50 years yield an aggregate net return of \$6,000, or \$1,300 more than if devoted to wheat.

The addition of only one more bushel of wheat per acre to the average yearly product would of course wipe out the above difference in favor of forestry; but, on the other hand, forestry can be as successfully carried on on rough, broken land as upon the comparatively level ground desirable for wheat. Such rough land being obtainable at from \$5 to \$20 an acre, percentage of profit returned from forestry is again brought into rivalry with that obtainable from a larger per-acre production of wheat.

It is taking a long time to disabuse the minds of our farmers of the old idea that land left to forestry is practically land left waste. But more and more the truth is gaining ground that trees, in the long run, are one of the most profitable of crops, and that the devotion of land to timber-raising serves a most useful purpose in the economy of the universe.—C. R. Barns, Extension Div., Minn. College of Agriculture.

Good Seed-Corn.

What is good seed-corn? When a farmer has tested his seed-corn by the single-ear method, and finds that some of it gives a vigorous germination of eighty per cent, the question arises as to the comparative value of such ears. In answer, it might be well to study the probabilities.

There are 3,556 hills per acre when corn is planted forty-two inches apart each way. This, with a perfect stand of three stalks per hill, would make 10,668 stalks per acre. Granting that seed of the above vitality would give only an eighty per cent stand, it would mean 2,133 missing stalks per acre; and allowing an average cured ear of seven ounces per stalk, this would mean a loss per acre of thirteen bushels. Carrying the matter one step farther—and granting that, when a bushel of seed-corn has been properly graded, there remains an amount sufficient to plant only five acres—we find the real difference between a bushel of corn that gives a perfect stand, and one that gives an eighty-per-cent stand, to be a matter of sixty-five bushels of corn at husking-time. Figuring this amount at any price that is reasonable, one cannot but condemn the use of seed-corn of such low vitality.

It is true that when the farmer knows his seed-corn has a vitality of but eighty per cent, he can arrange to drop more corn per hill. Logically, he will raise the percentage of stand by so doing, but he has done nothing to get rid of the weakly stalks, and is bound to have a certain percentage of crowded hills. And when he has husked the small ears of the crowded hill, and the "nubbin" of the weakly stalk, he has reaped the harvest of poor management, and should be wiser as to what is good seed-corn.—O. M. Olson, Extension Division, Minn. College of Agriculture.

All farm animals have an instinctive craving for salt. But if it is so placed as to be always within their reach, they will consume just as much as they need, and no more. It is only when it has been kept from them for a long period that there is danger of their eating too much. It is therefore an excellent practice to keep it in a box or boxes where they can have access to it whenever they desire. When they are salted, as is the practice with many farmers, only once a week, while some may get enough, others may suffer from a deficient supply. Salt promotes an active circulation of the blood, which never becomes thick and sluggish so long as the supply is plentiful; it assists digestion, and is often a preventative of disease. It is so cheap that no stock-raiser can really afford to deny to his animals all they want of it.

One of the problems of the poultry-yard is how to supply water to the fowls in cold weather at such a temperature that they will not be chilled through when they drink. Hot water is not good for the hen, and she dislikes it, as does a man, when it is merely warm. Plenty of pure fresh water is a necessity to the laying hen, and she wants it just cool enough to quench her thirst. People who are on the lookout for eggs will see to it that water is supplied often, and, if possible, in vessels that will not freeze over or become foul. A vessel with an outer jacket, something like a fireless cooker, taken into the house at night, and warmed through when it goes to the coops in the morning, is suggested as meeting the requirements of the case.